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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/775,935 | 02/10/2004 | Takeshi Nogami | 09792909-5802 | 3159 |
| 26263 | 7590 | 08/10/2006 | | EXAMINER |
| SONNENSCHEIN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080 | | | | VAN, LUAN V |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1753 | |

DATE MAILED: 08/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|------------------------------|-----------------|---------------|
| | 10/775,935 | NOGAMI ET AL. |
| Examiner | Art Unit | |
| Luan V. Van | 1753 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 10 February 2004.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-13 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-13 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) All b) Some * c) None of:
1. , Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/10/04

4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. .
5) Notice of Informal Patent Application (PTO-152)
6) Other: .

DETAILED ACTION

Priority

It is noted that this application appears to claim subject matter disclosed in prior Application No. 10/149858, filed October 7, 2002. A reference to the prior application must be inserted as the first sentence(s) of the specification of this application or in an application data sheet (37 CFR 1.76), if applicant intends to rely on the filing date of the prior application under 35 U.S.C. 119(e), 120, 121, or 365(c). See 37 CFR 1.78(a). For benefit claims under 35 U.S.C. 120, 121, or 365(c), the reference must include the relationship (i.e., continuation, divisional, or continuation-in-part) of all nonprovisional applications. If the application is a utility or plant application filed under 35 U.S.C. 111(a) on or after November 29, 2000, the specific reference to the prior application must be submitted during the pendency of the application and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior application. If the application is a utility or plant application which entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the specific reference must be submitted during the pendency of the application and within the later of four months from the date on which the national stage commenced under 35 U.S.C. 371(b) or (f) or sixteen months from the filing date of the prior application. See 37 CFR 1.78(a)(2)(ii) and (a)(5)(ii). This time period is not extendable and a failure to submit the reference required by 35 U.S.C. 119(e) and/or 120, where applicable, within this time period is considered a waiver of any benefit of such prior application(s) under 35 U.S.C. 119(e),

120, 121 and 365(c). A benefit claim filed after the required time period may be accepted if it is accompanied by a grantable petition to accept an unintentionally delayed benefit claim under 35 U.S.C. 119(e), 120, 121 and 365(c). The petition must be accompanied by (1) the reference required by 35 U.S.C. 120 or 119(e) and 37 CFR 1.78(a)(2) or (a)(5) to the prior application (unless previously submitted), (2) a surcharge under 37 CFR 1.17(t), and (3) a statement that the entire delay between the date the claim was due under 37 CFR 1.78(a)(2) or (a)(5) and the date the claim was filed was unintentional. The Director may require additional information where there is a question whether the delay was unintentional. The petition should be addressed to: Mail Stop Petition, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

If the reference to the prior application was previously submitted within the time period set forth in 37 CFR 1.78(a), but not in the first sentence(s) of the specification or an application data sheet (ADS) as required by 37 CFR 1.78(a) (e.g., if the reference was submitted in an oath or declaration or the application transmittal letter), and the information concerning the benefit claim was recognized by the Office as shown by its inclusion on the first filing receipt, the petition under 37 CFR 1.78(a) and the surcharge under 37 CFR 1.17(t) are not required. Applicant is still required to submit the reference in compliance with 37 CFR 1.78(a) by filing an amendment to the first sentence(s) of the specification or an ADS. See MPEP § 201.11.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-5 are rejected under 35 U.S.C. 102(e) as being anticipated by Ting et al.

Regarding claim 1, Ting et al. teach a semiconductor manufacturing apparatus comprising: an electrolytic plating chamber 10 (Figs. 1-2) with which an electrolytic plating apparatus responsible for electrolytic plating of a substrate is constructed; an electrolytic polishing chamber 10 (Figs. 1-2, column 4, lines 18-31) with which an electrolytic polishing apparatus responsible for electrolytic polishing of the substrate is constructed; and a conveying chamber 51 (Fig. 12) having installed therein a conveying instrument responsible for loading/unloading (column 17, lines 9-13) of the substrate to or from said electrolytic plating chamber and to or from said electrolytic polishing chamber, and being connected respectively to said electrolytic plating chamber and said electrolytic polishing chamber.

Regarding claims 2 and 4, Ting et al. teach the electrolytic plating or polishing chamber with which the electrolytic plating or polishing apparatus is constructed comprises: a holder 13 (Figs. 2-3) for holding the substrate; a cup 12 (Figs. 2, 4-9) provided so as to oppose to said holder and is capable of forming a closed space, into

which an electrolytic plating solution can be filled, together with the substrate held by said holder; and a nozzle 18 (Figs. 5-6) for supplying a process liquid onto a surface of the substrate held by said holder.

Regarding claim 3, the apparatus of Ting et al. is structurally capable of operating with a cleaning liquid.

Regarding claim 5, Ting et al. teach the manifolds 18 and 19 (Fig. 5-6) having a plurality of nozzles for injecting DI water and/or nitrogen (column 11, lines 10-37). The nozzles of Ting et al. is structurally capable of operating with a cleaning liquid or etching solution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 6-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ting et al. in view of Maydan et al.

Regarding claim 6, Ting et al. teach a semiconductor manufacturing apparatus comprising: an electrolytic plating chamber 49 (Fig. 12) with which an electrolytic plating apparatus responsible for electrolytic plating of a substrate is constructed; an electrolytic polishing chamber 49 with which an electrolytic polishing apparatus responsible for electrolytic polishing of the substrate is constructed; an electroless plating chamber 49 (the plating chamber of Ting et al. is structurally capable of being used as an electroless plating chamber in the absence of an applied current) with which an electroless plating apparatus responsible for electroless plating of the substrate is constructed; and a conveying chamber 51 having installed therein a conveying instrument responsible for loading/unloading of the substrate to or from said electrolytic plating chamber, to or from said electrolytic polishing chamber, to or from said electroless plating chamber, and being connected respectively to said electrolytic plating chamber, said electrolytic polishing chamber, and said electroless plating chamber.

Ting et al. differ from the instant claims in that the reference does not explicitly teach an annealing chamber.

Maydan et al. teach an apparatus comprising an annealing chamber 211 (Fig. 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Ting et al. by using the annealing chamber of Maydan et al., because an annealing chamber is typically utilized in substrate processing systems to enhance the properties of the deposited materials by

recrystallization of the deposited films, such as copper films, which can cause the flow of the deposited material to fill voids formed in features, purify layers of contaminants, such as oxygen, encourage diffusion of dopants, such as phosphorus, in the deposited materials, and manage crystal growth and orientation to control film properties (column 7, lines 49-61 of Maydan et al.)

Regarding claim 7, Ting et al. teach said conveying chamber is further connected with a liquid treatment chamber for supplying a process liquid, and said conveying instrument is responsible for loading/unloading of the substrate to or from said electrolytic plating chamber, to or from said electrolytic polishing chamber, to or from said electroless plating chamber, and is also responsible for loading/unloading of the substrate to or from said liquid treatment chamber (column 17, lines 3-34).

Regarding claim 8, Ting et al. teach the electrolytic plating chamber with which the electrolytic plating or polishing apparatus is constructed comprises: a holder 13 (Figs. 2-3) for holding the substrate; and a nozzle 18 (Figs. 5-6) for supplying a process liquid onto a surface of the substrate held by said holder.

Regarding claims 9 and 13, Ting et al. teach the manifolds 18 and 19 (Fig. 5-6) having a plurality of nozzles for injecting DI water and/or nitrogen (column 11, lines 10-37). The nozzles of Ting et al. is structurally capable of operating with a cleaning liquid or etching solution.

Regarding claims 10 and 12, Ting et al. teach the electrolytic plating or polishing chamber with which the electrolytic plating or polishing apparatus is constructed comprises: a holder 13 (Figs. 2-3) for holding the substrate; a cup 12 (Figs. 2, 4-9)

provided so as to oppose to said holder and is capable of forming a closed space, into which an electrolytic plating solution can be filled, together with the substrate held by said holder; and a nozzle 18 (Figs. 5-6) for supplying a process liquid onto a surface of the substrate held by said holder.

Regarding claim 11, the apparatus of Ting et al. is structurally capable of operating with a cleaning liquid.

Conclusion

The prior art made of record and not relied upon is considered pertinent to the applicant's disclosure. Ritzdorf et al. and Hongo et al. also teach multiple-chamber systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan V. Van whose telephone number is 571-272-8521. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LVV
August 3, 2006



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